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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 10/776,508 | 02/12/2004 | Donald J. Curry | 118591 | 3683 |
| 27074 | 7590 | 12/13/2007 | | |
| OLIFF & BERRIDGE, PLC. P.O. BOX 320850 ALEXANDRIA, VA 22320-4850 | | | EXAMINER TYLER, NATHAN K | |
| | | | ART UNIT 2625 | PAPER NUMBER |
| | | | NOTIFICATION DATE 12/13/2007 | DELIVERY MODE ELECTRONIC |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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| | | | |
|------------------------------|--------------------------------------|-------------------------------------|--|
| Office Action Summary | Application No. 10/776,508 | Applicant(s) CURRY ET AL. | |
| | Examiner Nathan K. Tyler | Art Unit 2625 | |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 05 November 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Arguments

1. Applicant's arguments filed 24 September 2007 have been fully considered but they are not persuasive.
2. Applicant argues that Seidner and Roetling fail to disclose "filtering the image data using the selected two or more filters from the filter bank," and "blending the two or more filtered image data to form blended image data." In response, the Examiner respectfully disagrees. As outlined in the previous office action, Seidner discloses that the filter used to filter the image data is chosen independently for each pixel of the image. Because each pixel is filtered using a potentially different filter, and the output of these filters is recombined to form the output image, the filtered image data is blended in this way. Therefore, while "two or more filters" is not explicitly stated by Seidner, it is easily understood that more than two filters will be used to filter the image in the system disclosed by Seidner.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 1, 2, 5, 8, 9, 10, 13, 15, 16, 17, 18, and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Seidner et al. (US 5333064 A) and Roetling (US 5343309 A).

Regarding **claims 1 and 9**, Seidner discloses generating an estimated screen frequency of the image data (with reference to Fig. 7, “Descreeener 12 first evaluates, in step 50, the screen parameters, such as frequency and angle” at column 12, line 58); selecting two or more filters based directly on the estimated screen frequency and one or more limit parameters (“The screen parameters thus evaluated are then utilized, in step 52, to produce the plurality of screen removal filters 20” at column 12, line 66. These filters are selected from the set of all filters that could be created at step 52, based one the screen frequency and a limit parameter – the screen angle); filtering the image data using the selected two or more filters (Fig. 7, step 56 “Perform Descreeening”); and blending the two or more filtered image data to form blended image data (“The spatial gradient information controls the adaptation of the filter, namely, for each pixel point, the spatial filter is adjusted” at Roetling column 5, line 58. Each pixel is filtered by a potentially different filter. Therefore, the resulting filtered image is the result of the output of multiple filters blended together).

Seidner does not teach selecting one or more of these filters from a filter bank.

Roetling discloses a descreening system in which a set of filters is chosen from a filter bank based on the screen frequency of the image (“The low-pass filter is designed to cut off spatial frequencies at or above the dominant halftone frequency. With a known periodic screen, the filter should remove the fundamental and the harmonics of the screen frequency.” at column 5, line 38; see Figure 2: the filter control 38 selects one or more filters 36, based on the output of the low pass filter 34, which is generated based on the screen frequency).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use a filter bank as disclosed by Roetling in the descreening filter selection disclosed by Seidner, as selecting a pre-made filter from a bank is considerably faster than generating a new filter during each iteration, and would reduce total processing time.

Regarding **claims 2 and 10**, the combination of Seidner and Roetling as applied to claim 1 discloses generating a blend select signal that indicates how the two or more filtered image data are to be blended (The blend select signal is the signal used to select the filter to be used for each pixel. By choosing the filter for each pixel, the way in which the filter outputs are blended is controlled).

Regarding **claims 5 and 13**, the combination of Seidner and Roetling as applied to claim 1 discloses generating intermediate filter selecting signals based on the estimated screen frequency (Roetling Figure 2, output of “Low Pass Filter” 34 is intermediate signal “FAI”); generating a filter selecting signal based on the intermediate filter selecting signals and the one or more limit parameters (Roetling Figure 2, output signal from “Filter Control” 38 is based on “FAI” signal and the spatial gradient of the image data (limiting parameter)); selecting the two or

more filters from the filter bank based on the filter selecting signal ("after the aspect ratio is selected in the block 44, a filter having the selected aspect ratio is selected in a block 46." at Roetling column 7, line 49. As stated previously, two or more filters are chosen for the image as a whole).

Regarding **claim 8**, the combination of Seidner and Roetling as applied to claim 1 discloses that the operations of generating, selecting filtering and blending are performed dynamically (see Roetling Fig. 2. Operations are performed dynamically by virtue of the iterative flow of the pixel data).

Regarding **claims 15, and 17**, Seidner discloses that the purpose of the descreeener is to remove the halftone from a scanned image, so that when the image is reproduced and a new screen is introduced, Moire does not occur ("Since the screen used for the second printing method is typically different from the original screen, a Moire effect will arise if the original screen is not removed" at Seidner column 1, line 24).

Seidner does not disclose a xerographic marking device or a digital photocopier incorporating the apparatus of claim 9.

Roetling discloses a xerographic marking device and a digital photocopier using a descreening process ("Input halftone images are obtained from a scanner... The system computer 16 is programmed to convert the halftone images to continuous tone images and to edit the continuous tone images as desired for subsequent printing." at Roetling column 4, line 31).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the descreening system disclosed by the combination of Seidner and Roetling in a

xerographic marking device or digital photocopier as disclosed by Roetling, so that the descreened image could be conveniently reproduced.

Regarding **claim 16**, the combination of Seidner and Roetling as applied to claim 1 discloses a scanning device incorporating the apparatus of claim 9 (Seidner Fig. 21, numeral 150 “scanner”).

Regarding **claim 18**, “means for generating” will be interpreted as being implemented using hardware and/or a software/hardware combination. The combination of Seidner and Roetling as applied to claim 1 discloses means for generating an estimated screen frequency of the image data; and means for selecting two or more filters from a filter bank based directly on the estimated screen frequency and one or more limit parameters; means for filtering the image data using the selected two or more filters from the filter bank; and means for blending the two or more filtered image data into blended image data (See grounds for rejection for claim 1).

Regarding **claim 20**, the combination of Seidner and Roetling as applied to claim 1 discloses a tangible computer-readable storage medium storing a set of program instructions executable on a data processing device (Seidner Figs. 10A-10G, for example, show computer code used to achieve the disclosed method), comprising instructions for generating an estimated screen frequency of the image data; and instructions for selecting a plurality of filters from a bank of filters based on only the estimated screen frequency and one or more limit parameters; instructions for causing the image data to be filtered using selected plurality of filters from the filter bank to produce a plurality of filtered image data; and instructions for blending the plurality of filtered image data into blended image data (see grounds for rejection for claim 1).

5. Claims 3, 4, 6, 11, and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Seidner and Roetling as applied to claim 1 above, and further in view of Lopez et al. (US 5822467 A).

Regarding **claims 3 and 11**, while the combination of Seidner and Roetling discloses processing the blended image data (“the final output contone image can be processed as desired to enhance it, change its contrast, etc” at Roetling column 8, line 31), the combination of Seidner and Roetling does not disclose sharpening selected portions of blended image data based on luminance of the blended image data.

Lopez discloses sharpening selected portions of blended image data based on luminance of the blended image data (If an operator selects a feature called auto-sharpening, an automatic filtering operation is provided in which an appropriate level of sharpening is determined based on an image type... the degree of sharpening is made a function of intensity” at column 2, line 19).

It would have been obvious at the time the invention was made to one of ordinary skill in the art to use the sharpening filter taught by Lopez to enhance the blended image data as taught by the combination of Seidner and Roetling, so that the blended image data could be sharpened without accentuating noise in dark areas of the image (“A Laplacian operator, while providing useful edge enhancement in light areas of an image, also accentuates noise in the dark areas of an image... For some images, there is a need for image sharpening without accentuating noise in the dark areas of the image” at Lopez column 1, line 62).

Regarding **claims 4 and 12**, the combination of Seidner, Roetling and Lopez as applied to claim 3 discloses increasing sharpness of a selected portion, if a luminance of the selected portion is below a predetermined threshold (“If a pixel has a numerical value greater than a threshold (decision 204), a first value of K is used (box 206). If a pixel has a numerical value less than the threshold, a second value of K is used” at Lopez column 5, line 35), a magnitude of sharpness being increased with increasing magnitude of the luminance (“Pixels with low intensity receive relatively little or no filtering... Pixels with higher intensity receive relatively more filtering” at Lopez column 2, line 27).

Regarding **claim 6**, the combination of Seidner, Roetling and Lopez as applied to claim 3 discloses selecting a luminance component of a portion of the blended image data; and adjusting the luminance component of the portion of the blended image data based on a sharpness control signal (Lopez Fig. 2: output of block 204 “pixel value > threshold” is the sharpness control signal).

Regarding **claim 19**, “means for blending” will be interpreted as being implemented using hardware and/or a software/hardware combination. The combination of Seidner, Roetling and Lopez as applied to claim 3 discloses means for increasing sharpness of a selected portions of blended image data if a luminance of a selected portion is below a predetermined threshold, a magnitude of sharpness being increased with increasing magnitude of the luminance (see grounds for rejection for claim 4).

6. Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combination of Seidner, Roetling and Sakatani et al. (US 6538771 B1).

Regarding **claims 7 and 14**, while the combination of Seidner and Roetling discloses processing the blended image data, the combination of Seidner and Roetling does not disclose selecting chroma components of a portion of the blended image data; and adjusting the chroma components of the portion of the blended image data based on a neutral control signal.

Sakatani discloses selecting chroma components of a portion of the blended image data; and adjusting the chroma components of the portion of the blended image data based on a neutral control signal (Fig. 4, numeral 405: "Gamma correction." Neutral control signal comes from numeral 407 "CPU").

It would have been obvious at the time the invention was made to one of ordinary skill in the art to perform gamma correction as taught by Sakatani on image data that has been de-screened as taught by the combination of Seidner and Roetling, so that the de-screened image data can be accurately reproduced by the printer ("In the gamma correction processor 405, gradation correction is performed so that the density is reproduced linearly for the input image data" at Sakatani column 7, line 12).

Conclusion

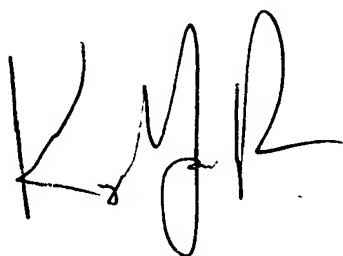
7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Nathan K. Tyler whose telephone number is 571-270-1584. The examiner can normally be reached on M-F 7:30am - 5:00pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, King Poon can be reached on 571-272-7440. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



KING Y. POON
SUPERVISORY PATENT EXAMINER



Nathan K Tyler
Examiner
Art Unit 2625